

REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1 through 30 remain in this case. Claims 1, 3, 8, 10, 11, 13, 14, 18, 25, and 26 through 30 are amended.

The drawings were objected to for several reasons. A first reason referred simply to the informal nature of the drawings. Formal drawings are submitted under separate cover with this paper. It is submitted that those formal drawings are in compliance with 37 C.F.R. §1.121(d), and that therefore the objection to the drawings on this basis will be overcome.

The drawings were also objected to for including reference numerals that are not mentioned in the description. The specification is amended above, in many places, to refer to the reference characters in Figures 2, 6a through 6c, 7a, 7b, 8a, and 8c through 8f, as pointed out by the Examiner. No new matter is presented by this amendment to the specification, and it is further submitted that no amendment to the drawings themselves is required because of this amendment to the specification. For these reasons, Applicants submit that these bases of objection to the drawings are overcome by the amendment to the specification.

Acceptance of the formal drawings submitted with this Amendment under separate cover, and withdrawal of the objections to the drawings, are respectfully requested.

The specification was objected to because of the improper use of certain trademarks. The specification is amended to capitalize each of the trademarks COMPACT FLASH, SMART MEDIA, MULTIMEDIA, and MEMORY STICK in the specification; claims 10, 18, and 25 are also amended accordingly. The trademark SD is already capitalized. Applicants submit that the objection to the specification on this basis is overcome by this amendment, and that no new matter is presented in this regard.

Claims 28 through 30 were rejected under §101 as directed to non-statutory subject matter. Claims 28 through 30 are amended to overcome the rejection, by now depending on amended claim 1, which is directed to a statutory process. Applicants respectfully submit that this amendment to claims 28 through 30 overcomes the §101 rejection of these claims.

Claims 3, 8, and 14 were each rejected under §112, ¶2, as indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Specifically, the Examiner found that the term “substantially” was indefinite as used in these claims. Claims 3, 8, and 14 are amended to cancel the word “substantially”, obviating the rejection to those claims.

Claims 1 and 4 through 7 were rejected under §102(a) as anticipated by the Graham et al. reference.¹ Claims 2, 28, and 29 were rejected under §103 as unpatentable over the Graham et al. reference in view of the Watanabe reference².

Claims 3 and 8 through 10, formerly dependent on claim 1, were objected to as depending upon a rejected claim, but were indicated as otherwise directed to allowable subject matter. Claims 3 and 8 are amended to now be in independent form, incorporating into each the limitations of the claims upon which they previously depended, as suggested by the Examiner. Applicants therefore respectfully submit that claims 3 and 8 through 10 are now in condition for allowance.

As mentioned above, claims 28 through 30 are amended to now depend upon amended claim 1.

¹ International Publication Number WO 01/78020 A1, published 18 October 2001. Upon further investigation of the Graham reference, however, Applicants have become aware of U.S. Patent No. 6,402,028 B1, issued June 11, 2002 to Graham, Jr., et al., based on a U.S. patent application filed on April 6, 1999. This U.S. Patent 6,402,028 appears to substantially correspond to, and is substantially cumulative to, Graham PCT reference applied against the claims. Accordingly, while Applicants will present argument relative to the Graham PCT reference applied against the claims because of the existence of the Graham, Jr. et al. U.S. Patent, Applicants do not admit that the Graham PCT reference is prior art against the claims in this case.

² U.S. Patent No. 6,148,366, issued November 14, 2000 to Watanabe, from an application filed November 24, 1997.

Claim 1 is amended to overcome the rejection, by clarifying its patentability over the Graham et al. reference and the other prior art of record in this case. Amended claim 1 now recites that the installed firmware, and also the new firmware that is provided to the host, sent from the host to a reader and from the reader to the memory storage device, and incorporated into the memory storage device, is for controlling the execution of instructions by control functions in the memory storage device. Support for this amendment is clearly provided by the specification,³ and as such no new matter is presented by this amendment.

The method of claim 1 provides important advantages in the use and updating of memory storage devices, such as memory cards. As described in the specification,⁴ the updating of flash memory firmware, such firmware allowing instructions to run on the flash memory card, has previously required the card to be sent back to the manufacturer to be updated, during which time the user of course does not have the use of the memory card; even so, the updating of firmware at the manufacturer has previously been a time-consuming and difficult process, and prone to error. The method of claim 1, on the other hand, enables the card user to upgrade memory card firmware, in a far more convenient, efficient, and uncomplicated manner than the conventional approach of sending the card back to the manufacturer.⁵ Accordingly, it is more likely that the memory card user will thus actually upgrade the card firmware when necessary or useful, thus improving the capabilities and reliability of memory cards in the field, and rendering memory cards and systems having this capability more attractive to customers, and thus advantageous in the marketplace.

Applicants respectfully submit that amended claim 1 is novel over the Graham et al. reference. Nowhere does the Graham et al. reference disclose the sending of new firmware, for controlling the execution of instructions by control functions in the memory storage device, from a host to reader and from the reader to the memory storage device, or incorporating this new firmware in the memory storage device to at least partially replace installed firmware that

³ Specification of S.N. 10/005,740, page 9, line 26 through page 10, line 6.

⁴ Specification, *supra*, page 1, line 22 through page 2, line 8; page 6, lines 22 through 29.

⁵ Specification, *supra*, page 7, lines 1 through 6.

also is for controlling the execution of instructions by control functions in the memory storage device, as required by the claim.

In contrast, the Graham et al. reference⁶ discloses at most the adding of applications to previously issued “smart” cards. The applications that are loaded onto the previously-issued smart cards are application programs, examples of which include a “stored-value application, a credit or debit application, a loyalty application . . .”.⁷ The reference distinguishes these applications from the “software infrastructure needed to support the loading, initialization, personalization and the running of applications”, such infrastructure including “the card’s operating system” and “a card executive (the main control program for the chip)”, and card and security domains.⁸ Specifically, the reference refers to an embodiment in which “the infrastructure includes a JAVA interpreter” in an embodiment “suitable for use with applications written in the JAVA programming language”.⁹ Accordingly, to the extent that the Graham et al. reference teaches the adding of software to a smart card, the software that is added are new and additional “applications”.¹⁰ The Graham et al. reference does not teach the incorporating of new software infrastructure (according to its terminology), nor any other software or firmware for controlling the execution of instructions by control functions, into its smart card. The reference therefore fails to disclose the providing, sending, and incorporating steps required by amended claim 1.

In addition, amended claim 1 requires the incorporating of the new firmware into the memory storage device, to at least partially replace the installed firmware. The Graham et al. reference nowhere discloses such replacing. To the extent that the reference teaches the programming of applications into after-issued smart cards, these applications are additional new applications, which are nowhere disclosed as replacing any existing application.¹¹

⁶ Graham et al., *supra*, page 37, lines 14 through 22; page 38, lines 11 through 18; page 38, lines 23 and 24; page 8, line 18; cited in Office Action of November 5, 2004, pages 7 and 8, ¶13.

⁷ Graham et al., *supra*, page 1, lines 14 through 16.

⁸ Graham et al., *supra*, page 5, lines 24 and 25.

⁹ Graham et al., *supra*, page 5, lines 27 through 30.

¹⁰ Graham et al., *supra*, page 37, lines 14 through 22; page 38, lines 7 through 10.

¹¹ Graham et al., *supra*, page 37, line 14 through page 40, line 14.

Accordingly, Applicants respectfully submit that amended claim 1 and its dependent claims are novel over the Graham et al. reference.

Applicants further respectfully submit that there is no suggestion from the prior art to modify the teachings of the Graham et al. reference, or combine the teachings of other references with those of the Graham et al. reference, in such a manner as to reach the requirements of amended claim 1 and its dependent claims.

As mentioned above, the Graham et al. reference fails to disclose any of the steps of amended claim 1, each of which refer to new firmware for controlling the execution of instructions by control functions in the memory storage device. The other references, including the Watanabe reference applied against claim 2, also lack teachings in this regard. Accordingly, even if suggestion is present to combine the teachings of these references with one another, the combined teachings of these references fall short of the requirements of amended claim 1 and its dependent claims.

Applicants further respectfully submit that there is no suggestion to modify the teachings of the Graham et al. reference, or any of the prior art, in such a manner as to reach the requirements of amended claim 1. This lack of suggestion is especially apparent considering the differences in the purpose of the invention of claim 1, as compared with the disclosed function of the Graham et al. reference.

The invention of amended claim 1 is directed to changing the very software that controls the operation of the control functions, as they execute instructions, in the memory card. In other words, the updated firmware according to this invention updates the manner in which information is stored in the memory card. According to the Graham et al. reference, in contrast, the adding of applications amounts to simply storing information, specifically program instructions for additional application programs, on the same smart card; the “software infrastructure” (according to the Graham et al. reference) including the operating system control mechanisms, which control the storing of this information, are in no way changed. In effect, the application-adding function disclosed in the Graham et al. reference, if performed to

the memory storage device workpiece of the method claim 1 would simply add data to the memory storage device; this operation would not replace any firmware for controlling the execution of instructions by control functions in the memory storage device, as required by the claim.

Applicants dispute the interpretation presented in the Office Action that the Watanabe reference refers to transferring commands “for sending firmware”.¹² Applicants submit that the Watanabe reference is instead directed to the efficient combining of write data (*i.e.*, data to be stored on the disk drive) to reduce overhead time on a SCSI bus.¹³ Nowhere does the Watanabe reference anywhere mention the updating or replacing of the firmware at the destination memory storage device, where the firmware is for controlling the execution of instructions by control functions in the memory storage device as claimed. Accordingly, Applicants submit that the Watanabe reference fails to suggest the modifying of the Graham et al. teachings, or of its own teachings combined with those of the Graham et al. reference, in such a manner as to reach the requirements of amended claim 1.

The other references, including the Datar et al. reference¹⁴ and the Pua et al. reference¹⁵, provide no such suggestion to modify the teachings of the Graham et al. reference. To the extent that the Datar et al. reference refers to upgrading “firmware”,¹⁶ this firmware refers to the operating programs for the overall system (including a microprocessor, DSP, system bus, local memory, etc.¹⁷), but not the firmware for controlling the execution of instructions by control functions in the memory storage device itself (*i.e.*, the Flash ROM of Datar et al.), as required by amended claim 1.

¹² Office Action, *supra*, page 12, ¶26.

¹³ See Watanabe, *supra*, column 2, lines 16 through 40.

¹⁴ U.S. Patent Publication No. 2002/0137501 A1, published September 26, 2002 from an application filed March 23, 2001.

¹⁵ U.S. Patent Publication No. 2002/0194403 A1, published December 19, 2002 from an application filed June 15, 2001.

¹⁶ Datar et al., *supra*, paragraphs [0003] through [0006].

¹⁷ Datar et al., *supra*, paragraphs [0011] through [0014].

The important advantages provided by the invention of amended claim 1, in permitting user-operable firmware upgrade of memory storage devices, such as flash memory cards, rather than requiring the cards to be sent back to the manufacturer, stem directly from the differences between the claimed method and the prior art. Accordingly, Applicants submit that these advantages support the conclusion that claim 1 and its dependent claims are patentably distinct over the prior art.

For these reasons, Applicants submit that amended claim 1 and its dependent claims 2, 4 through 7, and 28 through 30, are novel and patentable over the prior art of record in this case.

Claims 11, 12, and 15 through 17 were rejected under §102(a) as anticipated by the Graham et al. reference. Claim 18 was rejected under §103 as unpatentable over the Graham et al. reference in view of the Pua et al. reference.

Claims 13 and 14 were objected to as depending on a rejected claim, but were indicated as directed to allowable subject matter.¹⁸ Claim 13 is amended to be presented in independent form, incorporating the limitations of claims 10 through 12 upon which it previously depended, as suggested by the Examiner; claim 14 is amended to avoid the §112 rejection, as mentioned above. Applicants submit that amended claims 13 and 14 are now in condition for allowance.

Claim 11 is amended to overcome the rejection to it and its dependent claims 12 and 15 through 18, by clarifying its patentability over the prior art. In the system of amended claim 11, the memory card is now recited as comprising control functions, memory, and installed card firmware for controlling the execution of instructions by the control functions. The providing means is now recited as providing new card firmware for controlling the execution of instructions by the control functions. The specification clearly provides support for the amendment to claim 11,¹⁹ and therefore no new matter is presented by this amendment.

The system of amended claim 11 provides the same important advantages as the method of claim 1, discussed above. Specifically, the system for updating firmware associated with a

¹⁸ Office Action, *supra*, page 20, ¶41.

¹⁹ Specification, *supra*, page 9, line 26 through page 10, line 6.

memory card of claim 11 permits the memory card user to update the firmware for the memory card, without sending the card back to the manufacturer for update. And the system of claim 11 updates this firmware in an efficient manner, avoiding the time and difficulty previously encountered at the manufacturer for such updates. The system of claim 11 thus enhances the likelihood that card firmware will be upgraded, thus improving the capabilities and reliability of memory card systems.

Applicants respectfully submit that amended claim 11 is novel over the Graham et al. reference. As discussed above, the Graham et al. reference fails to disclose means for providing new card firmware for controlling the execution of instructions by the control functions of a memory card, much less means for incorporating this new card firmware into the memory card to replace, at least partially, installed card firmware that also controls the execution of instructions by the memory card control functions, as required by the system of amended claim 11. The Graham et al. reference discloses the adding of applications to previously issued “smart” cards, but according to the teachings of the reference itself, these applications are distinct from the “software infrastructure” (e.g., operating system, “card executive”, etc.) that supports the loading, initialization, personalization and the running of applications.²⁰ The Graham et al. reference simply does not teach the incorporating of new software infrastructure (according to its terminology) into its smart card, and therefore fails to disclose the incorporating of new firmware (much less replacing existing firmware) that controls the execution of instructions by control functions of the memory card. The Graham et al. reference therefore fails to anticipate amended claim 11.

Accordingly, Applicants respectfully submit that amended claim 11 and its dependent claims are novel over the Graham et al. reference.

Applicants further respectfully submit that there is no suggestion from the prior art to combine the teachings of other references with those of the Graham et al. reference, or modify such teachings in such a manner as to reach the requirements of amended claim 11 and its dependent claims.

None of the applied references, including the Graham et al. reference and the Pua et al. reference applied against claim 18, discloses any means for incorporating new firmware for controlling the execution of instructions by control functions in the memory storage device, much less to replace existing installed firmware. Accordingly, even if suggestion is present to combine the teachings of these references with one another, the combined teachings of these references fall short of the requirements of amended claim 11 and its dependent claims.

Applicants further respectfully submit that there is no suggestion to modify these teachings in such a manner as to reach the requirements of amended claim 1. As discussed above, this lack of suggestion is especially apparent considering the differences in the purpose of the system of claim 11, relative to the disclosed function of the Graham et al. reference.

As discussed above relative to claim 1, the system of amended claim 1 changes the memory card firmware, such firmware controlling the operation of the control functions on the memory card itself; this system thus updates the manner in which information is subsequently stored on the memory card. But the Graham et al. reference simply adds additional applications (replacing none); to do so, the Graham et al. system simply stores additional information on the same smart card, and does not incorporate new or different “software infrastructure” (using the Graham et al. terminology) in the smart card. In other words, the Graham et al. reference simply adds additional application program data to the available memory space on the smart card, using the same (and unmodified) “software infrastructure”.

The other references, including the Watanabe reference, Datar et al. reference, and the Pua et al. reference, provide no such suggestion to modify the teachings of the Graham et al. reference in such a manner as to reach the claim. The Watanabe reference is simply for streamlining the storage of data on a disk drive; the control firmware for the disk drive is not modified. While the Datar et al. reference mentions upgrading “firmware”,²¹ this updated firmware is not the firmware for the memory storage device, but is instead the firmware that controls the operating programs of the overall system including the memory storage device; the

²⁰ Graham et al., *supra*, page 5, lines 24 and 25.

²¹ Datar et al., *supra*, paragraphs [0003] through [0006].

memory storage device serves as the program memory for the system. And the Pua et al. reference, asserted as teaching various ones of the memory storage device types of claim 18,²² provides no disclosure or suggestion regarding upgrading of firmware in such storage devices.

And furthermore, the above-mentioned advantages provided by the system of amended claim 11 result directly from the differences between the claimed system and the prior art. Therefore, because of the shortfall of the teachings of the references, taken individually or in combination, because of the lack of suggestion to modify these teachings, and because of the advantages provided by the claimed system relative to conventional systems, Applicants submit that claim 11 and its dependent claims are patentably distinct over the prior art.

For these reasons, Applicants submit that amended claim 11 and its dependent claims 12 and 14 through 18 are novel and patentable over the prior art of record in this case.

Claims 19 through 24 were rejected under §103 as unpatentable over the Graham et al. reference, in view of the Datar et al. reference. Claim 25 was rejected under §103 as unpatentable over the Graham et al. and Datar et al. references, further in view of the Pua et al. reference.

Applicants respectfully traverse the §103 rejection of claims 19 through 25.

The Examiner asserted that the Graham et al. reference taught all elements of claim 19 except for the firmware being arranged to cooperate with the storage element to store the data and execute instructions. But the Examiner asserted that the Datar et al. reference discloses that firmware is stored in external non-volatile memory and is substantially updated. The motivation to combine these teachings was found, by the Examiner, to be the providing of updated firmware while consuming less time and reducing wear and tear on the devices.²³

²² Office Action, *supra*, page 15 and 16, ¶34.

²³ Office Action, *supra*, pages 13 and 14, ¶28.

As admitted by the Examiner,²⁴ the Graham et al. reference does not disclose firmware being arranged to cooperate with the storage element to store the data and to execute instructions and that can be substantially updated by in-system-programming capabilities. But contrary to the assertions by the Examiner, Applicants further submit that the Datar et al. reference also does not disclose in-system-programming for updating such firmware.

The Datar et al. reference does refer to the updating of firmware. But the firmware that is updated by the Datar et al. reference is that which operates the system containing the memory device storing the firmware. Specifically, the Datar et al. reference refers to firmware as the code to which systems based on one or more processors (microprocessors, DSPs, microcontrollers, and special purpose engines) operate.²⁵ While the Datar et al. reference discloses that non-volatile memory stores this system firmware,²⁶ it does not disclose the existence of any firmware in the memory storage device that cooperates to store data in that device or to execute instructions in that device, much less to support in-system-programming capabilities. Rather, the reference discloses circuitry required to program and erase the Flash ROM.²⁷ Nowhere does the reference disclose that this circuitry is embodied in firmware (to cooperate with the storage element to store the data, as claimed), much less disclose that this circuitry (or alleged firmware) can be updated. Rather, the reference discloses that it is simply the contents of the Flash ROM (these contents happen to be firmware code for a microprocessor in the system) that is updated by the erase and programming operations.²⁸

Accordingly, Applicants respectfully submit that the combined teachings of the Graham et al. and Datar et al. references fall short of the requirements of claim 19 and its dependent claims.

Applicants further respectfully submit that there is no suggestion from the references to modify the combined teachings of these references in order to reach claim 19.

²⁴ Office Action, *supra*, page 13.

²⁵ Datar et al., *supra*, paragraph [0002].

²⁶ Datar et al., *supra*, paragraph [0004].

²⁷ Datar et al., *supra*, paragraph [0027].

²⁸ Datar et al., *supra*, paragraph [0031].

Specifically, there is no suggestion from either reference of any need to update the firmware that cooperates with a storage element to store data in a memory storage device. The Graham et al. reference discloses only adding new information to a memory storage device (*i.e.*, a smart card), in the form of new applications, but nowhere discloses any reason why one would want to modify firmware used to store such data. Similarly, the Datar et al. reference discloses only erasing and reloading the contents of a Flash ROM to provide firmware that controls other system functions (*i.e.*, microprocessors, etc.). But nowhere does the Datar et al. reference disclose any desire or rationale for modifying any circuitry (much less firmware) that effects the storing of this data; the reference instead discloses only the modifying of the stored data itself.

And considering the important advantages in permitting a user to update the firmware for a memory card, without sending it back to the manufacturer, such advantages supporting the patentability of the claimed memory storage device, Applicants submit that there is no suggestion to combine and modify the prior art in this case in such a manner as to reach claim 19 and its dependent claims.

For these reasons, Applicants respectfully submit that claims 19 through 25 are patentably distinct over the prior art of record in this case.

Claims 26 and 27 were rejected under §102(a) as anticipated by the Graham et al. reference.

Claim 26 is amended to incorporate limitations corresponding to claim 13, which the Examiner found to be directed to allowable subject matter.²⁹ Specifically, amended claim 26 requires that the firmware is arranged to support in-programming capabilities that include receiving, from a computing system, a first command into which updated firmware code for the memory device is embedded, and providing, to the memory device via the port, the updated firmware code for the memory device for at least partially replacing installed firmware code in

²⁹ Office Action, *supra*, page 20, ¶41.

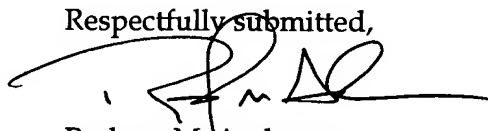
the memory device. Claim 27 is amended to properly depend on claim 26. No new matter is presented by this amendment to claims 26 and 27.

Applicants respectfully submit that the adapter of claim 26 corresponds substantially to the allowing means of allowable claim 13, and includes the further limitation that the new card firmware at least partially replaces the installed firmware code in the memory device, as present in claim 13. Accordingly, Applicants respectfully submit that claims 26 and 27 are now novel and patentable over the prior art of record in this case.

The reference cited by the Examiner as pertinent, but not applied against the claims, has been considered but is not felt to come within the scope of the claims in this case.

For all of the above reasons, Applicant respectfully submits that all claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,



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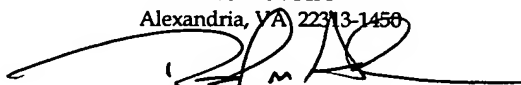
37 C.F.R. 1.8

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